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great age. Mr Nelson is of the opinion that the mounds in general are fully as ancient as other known American shell deposits.

The soft-shell clam and soft-shell mussel are common to all the mounds and usually make up the bulk of the material, but the hard shelled clam and mussel, the cockle, abalone, and various small univalves occur. Mixed with the shells is a large percentage of ashes and charcoal and varying quantities of rock and waterworn pebbles. Occasionally there seems also to have been added more or less earth. Bones of a large number of quadrupeds and birds are mixed with the shells but these occur more commonly in the upper layers.

Artifacts and other indications of industrial life are found at all depths but are less abundant in the earlier layers. The implements of later times show a greater degree of specification and perfection of workmanship than those from the older layers, although the change in progress does not appear so clear and marked as one would naturally expect. Spear and arrow points, mortars and pestles, hammer stones, and roughly grooved sinkers were found at all levels in many of the deposits. Highly polished and graceful bone awls, "charm stones," delicately worked stone pipes, bone whistles, stone labrets, certain shell beads and pendants, all appear to be confined to the upper layers of at least some of the largest mounds. Grooved sinkers in great abundance were found in some deposits, while in others close by they were apparently absent. No potsherds were found in any of the mounds. Human remains (burials) were in nearly all the large mounds. The skeletons were in various positions, singly or in groups of two or more, none, however, were found in a sitting posture. The great majority were not accompanied by artifacts although a few pipes and weapons occurred with the remains of men, and a mortar, pestle, and awls with the women. The remains of children were almost always accompanied by beads and trinkets. No careful study of the osteological remains has been made. In conclusion Mr Nelson finds it difficult to reject the opinion that the original migrants who began these refuse heaps were of the same race if not the direct ancestors of the historic Indians of this region. He thinks it possible, however, that a careful study of the remains may lead to a different view. The paper is illustrated by half tone reproductions of eight photographs of the more prominent shellheaps and a large map showing the location of all the shell heaps and minor camp sites of the region.

CHARLES C. WILLOUGHBY.

The Ellis Landing Shellmound. By N. C. NELSON. University of California Publications in American Archaeology and Ethnology, Vol. 7, No. 5, pp. 357-426, Berkeley, 1910.

The Ellis Landing shellmound furnishes incontestible evidence of having survived a considerable subsidence of the San Francisco Bay country which

occurred subsequent to the arrival of primitive men in that region. For this reason it was singled out for special investigation. Excavations were carried on in 1906 by Mr Nelson, and during the following year when the mound material was removed for grading purposes Mr Nelson was present for the purpose of collecting data and the artifacts and skeletons which were brought to light during the excavations. The mound lies in the marsh which fringes a greater portion of the bay shore. About half of it has been destroyed by wave action. This erosion is of recent occurrence, for twenty years ago the refuse heap was not only intact but was protected from the waters of the bay by a strip of marsh 30 to 40 feet wide. The distance eroded in this short time is approximately 200 feet. The base of the mound, now submerged, is about 460 feet by 245 feet. The outline is an irregular oval. The greatest height of the heap was 17 feet above marsh level and its greatest depth below the same level was nearly 16 feet. The vertical distance from its highest point to the bottom immediately below was about 28 feet 6 inches. On a volume basis Mr Nelson estimates its age to be about 3500 years. The mound was used from the beginning as a burial place and probably also as a residence site, there being several house pits in a good state of preservation upon it when first examined. The excavation of 1906 consisted of a trench 108 feet in length and 6 feet wide. This was dug to about six inches below the marsh level, which was as far as the ground waters would permit. The wall was kept straight and perpendicular and its special and characteristic features were charted as the work progressed. The number of artifacts recovered was 78. Besides a large number of animal bones, 16 human skeletons were found, most of them complete and in comparatively good condition. During the removal of the upper portion of the mound material for grading purposes 126 human skeletons were uncovered, and about 265 artifacts were secured.

For the purpose of studying the deposits below water line a shaft was sunk, the water being removed by pumping. The yield of artifacts in this shaft was 38 in number. Scattered fragments of the skeletons of two individuals were found 7 feet below high tide, and two nearly complete skeletons were recovered from near the bottom. No animal bones were found in the lower 8 feet of the shell deposit. The mound was made up mostly of clam and mussel shells, but oyster, cockle, haliotis, and a few other species were found. The lower portion of the mound was composed principally of mussel shells, and only in the upper 8 feet were clam shells at all common. Of the artifacts secured the various well recognized types are mentioned in groups, and only the new forms receive specific attention. Perhaps the most evenly distributed objects were mortars and pestles. They occurred in fragmen-

tary condition at all levels, and only a few unbroken specimens were obtained. In size the mortars ranged from about three inches to eighteen inches in diameter, and the pestles have the same relative variation. Hammer stones, rubbing stones, perforated and grooved sinkers were obtained. More than 70 "charm stones" (pear-shaped pendants) were secured showing the usual variety of forms, these specimens being found only in the upper levels of the deposit. Blades and projectile points, well chipped from chert and obsidian, occurred from the top to the bottom of the mound. Of the few tubular steatite pipes recovered, two of the most interesting were found with a painted skeleton. Bone awls and needles occurred more commonly in the upper part of the mound. Among other bone objects were spatula-shaped implements, notched bones, whistles, and a few other forms, also a few bone and shell ornaments.

Mr Nelson concludes that the material culture of the builders of the mound, represented by a broken chain of evidence only, seems to show that the knowledge and dexterity of the people increased as time went on. The first inhabitants possessed roughly made stone implements; they prepared vegetable food; they knew the use of fire; they painted and buried their dead. The last people to dwell on the mound had well made stone implements, a variety of bone tools, and several forms of ornaments of bone and shell which were similar to those of the historic Indians of central California. The paper is well illustrated by half-tone photographs of the mound and of the artifacts and osteological remains, and by well executed maps, ground plans, and vertical sections.

This publication forms a valuable contribution to the archeological literature of California, and can but prove an incentive to more painstaking and thorough work in the shell mounds of America generally. Perhaps no class of archeological remains furnishes a more consecutive record of the people of a given locality than some of our more extensive shellheaps when systematically and carefully explored.

CHARLES C. WILLOUGHBY.

Ethnologica im Auftrage des Vereins zur Förderung des städtischen Rautenstrauch-Joest-Museums für Völkerkunde in Cöln. Herausgegeben von DR. W. FOY, Direktor des Museums. I, Leipzig, 1909. Verlag von Karl W. Hiersemann. 8°, vii, 282 pp.

Ethnologica, which is to be published in yearly numbers as the organ of the Rautenstrauch-Joest Ethnological Museum in Cologne, is devoted to the culture-historical method of observation and treatment of museum material as opposed to mere catalogue-description. The "culture-historical" point